DCS & Labelling Worldwide

CL608e/612e Printers Operation Manual

Issued December 2000

SATO Group of Companies

www.satoworldwide.com

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Warning: This equipment complies with the requirements in Part 15 of FCC rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception requiring the operator to take whatever steps necessary to correct the interference.

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Warning

It is essential that the safety and operating procedures contained within this manual be brought to the attention of, and are used by, all personnel likely to operate this printer/product.

This printer/product must only be used for the purpose for which it was designed.

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Electrostatic discharges on the connector pins and on the memory card may damage the printer.

In the case of fire, water must not be used on the product to extinguish the fire, and the appropriate type of fire extinguisher should be readily available.

No modifications, either mechanical or electrical, should be made to this printer/product or accessory without the written consent of SATO Europe N.V. Any modifications made without this consent may invalidate guarantee claims.

Other manuals relating to this printer include additional information relating to other aspects of the safe operation of the printer, and are available from your SATO supplier.

All consumable waste, such as the label backing paper and used carbon ribbon must be disposed of carefully, and in a manner that will cause the minimum of environmental pollution.

Should you have any doubts regarding the setting, operating or any safety aspects of this printer/product, please contact your SATO supplier.

SATO Europe N.V. makes no guarantee that all the features described in this manual are available in all models, and, due to SATO's policy of continuous development and improvement, specifications are liable to change, without notice.

Consumables

Always use SATO carbon ribbons or equivalent. The use of incorrect materials may cause malfunctions of the printer and void the warranty.

Conventions

Text that appears bold italic and all in capitals such as ***LABEL*** refers to a key or an LED on the operation panel.

Text that appears enclosed in brackets such as <ESC> refers to an Escape sequence of a data string.

Text that appears bold italic such as ***On-Line*** refers to a function or to a result.

Text that appears in bold such as **VR1** refers to electrical components like pins, resistors connectors and so on.

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1. Specifications

The major difference in the CL608e and the CL612e printers is the resolution of the Print Head. The CL608e with its 203 dpi Print Head provides an economical labeling solution for most applications. The CL612e provides a higher print resolution, 305 dpi, to give laser quality printing. It is useful when higher resolution is needed for detailed graphic images.

	CL608e	***CL612e***
Print Type	Direct Thermal, Thermal Transfer	
Resolution	0,125 mm (8 dot/mm, 203 dpi)	0,083 mm (12 dot/mm, 305 dpi)
Speed	User selectable from 100 mm/sec to 200 mm/sec	
Darkness	3 steps; selectable by printer driver (<ESC> codes) or via display	
Print Area	Pitch / Width 178 mm / 152 mm Standard 356 mm / 152 mm <AX> 1249 mm / 152 mm <EX>	Pitch / Width 178 mm / 165 mm Standard 356 mm / 165 mm <AX> 704 mm / 165 mm <EX>
Media Width	47~177 mm (50~180 mm incl. backing paper)	
Media Length and Calliper	Batch: 16~356 (19~359 mm incl. backing paper) 0,08~0,21 mm Dispense: 22~356 (25~359 mm incl. backing paper) 0,1~0,16 mm Cutter: 32~356 (35~359 mm incl. backing paper) 0,1~0,25 mm Tear-Off 16~356 (19~359 mm incl. backing paper) 0,08~0,21 mm	
Label Roll	Maximum Roll Diameter: 200 mm (Face-In) Label Inner Core Diameter: 76 mm Standard (40mm optional)	
Media Types	Die-Cut Label, Continuous Material, Tag Material. Roll Type: Face-In or Face-Out, Fan-Fold Type.	
Carbon Ribbon	450 Metre Long, Face-In, I.D. 25.4 mm, Thickness: 4.5 Micron, Black and Coloured	
Barcodes	UPC A/E, EAN 8 & 13, Code 39, Code 128, UCC/EAN 128, Interleaved 2 of 5, Industrial 2 of 5, Matrix 2 of 5, Codabar, MSI, Bookland, Postnet	
Barcode Ratios	1:2, 1:3, 2:5	
Barcode Sizes	Height: 4 dots to 600 dots; Width: User definable	
Rotational Capability	90° steps	
2-D Codes	Data Matrix, Maxicode, PDF 417, QR-Code	
Fonts	U, S, M, WB, WL, XU, XS, XM, XB, XL, OCR-A/B, Outline Font (50-999) Rasterizer Font Triumvirate & Times (08 – 99 points or 16 – 999 dots)	

Label Sensing	Reflective Sensor (I-mark), bottom reading See-through Sensor (Gap), movable	
CPU	32 bit SH3 RISC Processor/ 133MHz	
Memory Capacity	16MB SDRAM; 2,9MB Input Buffer; 2MB Flash Memory Internal (standard) Memory Expansion Optional: - Internal: 4MB Flash Memory SIMM Card - External: up to 4MB S-RAM Card or up to 16MB Flash Card	
Interfaces	ECP Parallel (IEEE 1284) Centronics Parallel RS232C Standard (2400 – 19.200 Baud) RS232C Highspeed (9600 – 57.600 Baud) USB (12Mbit/s) LAN (TCP/IP protocol 10/100 Base T) Twinax/Coax RS422 / 485	
Front Panel	Operation Switches: Setting Switches: LED: LCD: Potentiometers:	Online Key, Feed Key 2 x 8 Dip-Switches Power ON, Online, Label End, Ribbon End, Error Condition Menu Controlled Printer Configuration and Error Messages Supported Languages: English (default), German, French, Spanish, Italian, Portuguese Display Contrast, Pitch, Offset, Print Darkness
Dimensions	Height: 298 mm Width: 352 mm Depth: 429 mm	
Weight	19 kg (standard)	
Power	110 - 240V (/+/- 10%), 50/60 Hz, Idle 50 W, maximum 490 W	
Environmental	Operating: +5 ~ +40°C, humidity 30 ~ 80% RH non-condensing Storage: -5 ~ +60°C, humidity 30 ~ 90% RH non-condensing	
Approvals	CE, TÜV-GS, UL, CSA	
Options	Rotary Cutter, Dispenser with External Backing Paper Rewinder, External Label Rewinder R610, Memory Expansion, Keyboard, Real Time Clock	

2. Introduction

The SATO CL608e/612e Printer Operation Manual provides information for installing and maintaining the SATO CL608e/612e printer. Step-by-step maintenance instructions are included in this manual with typical problems and solutions. It is recommended that you become familiar with each section in this manual before installing and maintaining the printer. This manual is divided into the following six sections:

- Chapter 1 - Specification
- Chapter 2 - Introduction
- Chapter 3 - Printer Configuration
- Chapter 4 - Media Loading
- Chapter 5- Troubleshooting
- Chapter 6 - Cleaning and Maintenance
- Appendix

2.1 Installation Considerations

Printer operation can be affected by the printer environment. The location of the printer should be free from dust, humidity, and sudden vibrations. To obtain optimum results from the printer, avoid locations influenced by:

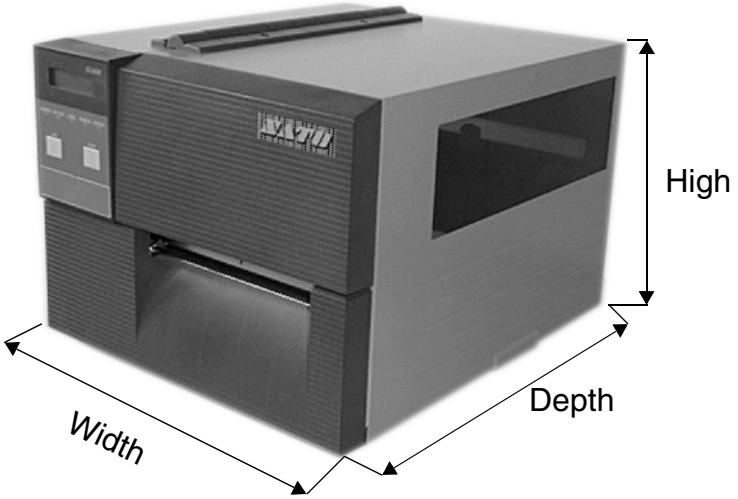
- Direct or bright sunlight since bright light will make the label sensor less responsive and may cause the label to be sensed incorrectly.
- Warm temperatures which can cause electrical problems within the printer.

2.2 Ribbon

Use only SATO thermal transfer ribbons which were formulated expressly for use in all SATO printers. Use of other than approved ribbons may result in unsatisfactory print quality and/or damage to the print head and may void your warranty.

2.3 Dimensions

NOTE: The exact position of components may vary, depending on the model.



Printer	Footprint		
	Width	Depth	High
Standard	355mm	429mm	299mm
With dispenser	355mm	545mm	299mm
With cutter	355mm	460mm	299mm

2.4 Operator Panel

Parts of the operation panel

The operation panel consists of a LCD display, five LED indicators, two push-buttons, two DIP switch arrays and four adjustment potentiometers. All of these are accessible from the front of the printer. They are used to set the printer operating parameters and to indicate the status of the printer to the operator. After you power on the printer, familiarize yourself with the keys and indicators, as it will help you understand the configuration process.

Display:

LCD display for:

- printer status (error messages)
- Printer setup
- Quantity
- Offline

LEDs:

POWER: LED illuminated when the power is on.

LABEL: LED illuminated when label supply is out.

RIBBON: LED illuminated when ribbon motion sensor does not detect any ribbon motion.

ERROR: LED illuminated when there is a system fault such as open print head, interface or system error.

ONLINE: LED illuminated when printer is ready to receive data. It is turned on and off by toggling the **LINE** key.

Push-buttons:

LINE Push-button. Pressing this key toggles the printer between the **On-Line** and **Off-Line** mode. When the printer is **On-Line**, it is ready to receive data from the host. This key can act as a pause during a print job, by taking the printer **Off-Line**.

FEED Push-button. Pressing this key feeds one blank label through the printer when it is **Off-Line**. When the printer is **On-Line**, the last label of the print buffer will be repeated.

DIP switches:

DSW: DIP switch array to set operational parameters of printer.

Potentiometers:

PRINT (VR1): Potentiometer to adjust print darkness (fine tuning).

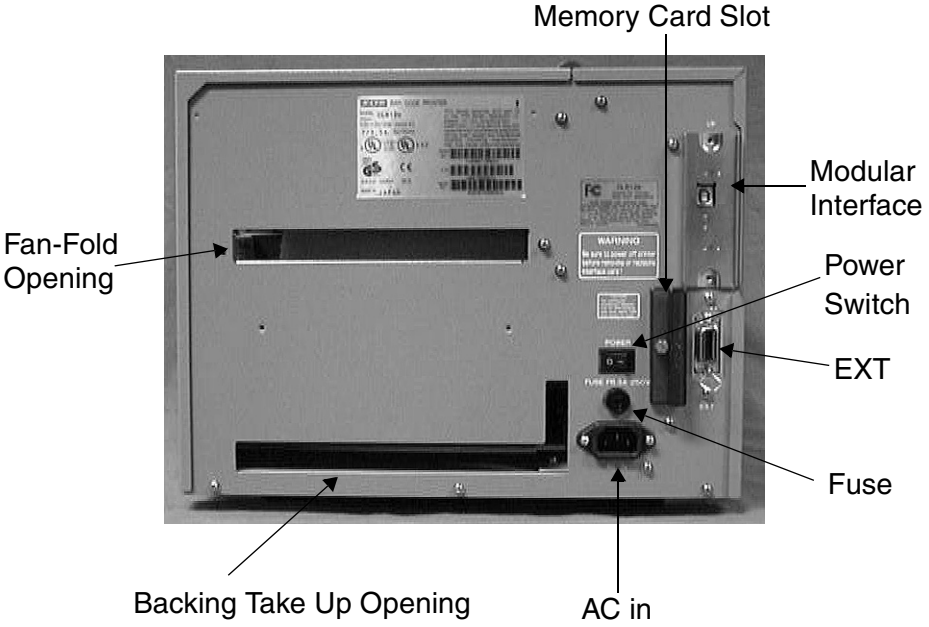
OFFSET (VR2): Potentiometer to adjust amount of back/forward feed for dispenser or cutter function (± 3.75mm). Independent from pitch adjustment.

PITCH (VR3): Potentiometer to adjust home position of the label (± 3.75mm). After the media pitch has been set using the pitch offset adjustment in the user mode, it is sometimes desirable to make minor adjustments. This can be done by using the **PITCH** potentiometer on the operation panel. This potentiometer is set at the factory so that it has a range of ± 3.75mm. The midpoint setting should have no effect on the pitch. Turning the potentiometer all the way clockwise (minus offset) should move the print position 2.0mm up towards the top edge of the label. Turning it all the way counterclockwise (plus offset) should move the print position down 2.0mm. Affects stop position of label feed, print position and dispense position.

DISPLAY (VR4): Display contrast

2.5 Rear Panel

Power switch:	To switch power on or off
AC input:	Input 230V 50/60Hz connector. Use the cable provided.
AC fuse:	Input power protection. Type 3A/250V, 20x5mm.
Modular Interfaces:	IEEE 1284 ECP Parallel, RS 232C High Speed Serial up to 57600bps; LAN Ethernet; USB, Twinax/Coax, RS422/485, RS232C up to 19200bps and Standard Parallel.
EXT:	External signal connector.
Memory Card Slot:	Optional for PCMCIA cards.

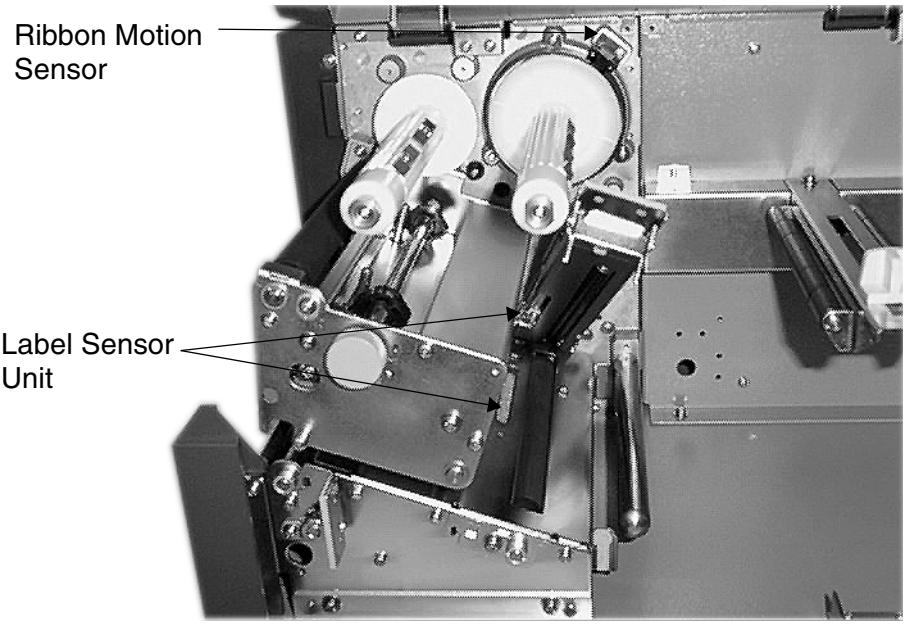


2.6 Switches And Sensors

Ribbon End Sensor: This sensor is a motion detector sensor that signals the printer when the ribbon supply is turning.

Head Open Switch: When the print head is opened, this switch is activated and the printer will stop printing.

Label Sensor Unit: This sensor unit contains two types of sensors, one for label gap (movable, 25 - 90mm from the inner label edge)) and one for I-Mark sensing (fixed).



2.7 Computer Connections

2.7.1 Bi-directional parallel interface (standard)

1. Turn off the power of the printer. Using an interface cable connect the computer to the bi-directional parallel interface connector at the rear panel of the printer.
2. Be sure to use a IEEE 1284 compatible cable.

Connector: 36 PIN Amp

Max. Cable length: 1,8 m Centronic
5 m IEEE 1284

Wire Connection Table for IEEE 1284 compatible cable:

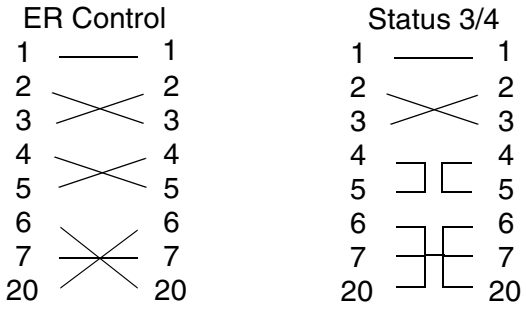
Host		Printer	Host		Printer
1	Strobe	1	14	LF	14
2	D0	2	15	Error	32
3	D1	3	16	Init	31
4	D2	4	17	Select in	36
5	D3	5	18	GND	33
6	D4	6	19	GND	19
7	D5	7	20	GND	21
8	D6	8	21	GND	23
9	D7	9	22	GND	25
10	AKN	10	23	GND	27
11	Busy	11	24	GND	29
12	PE	12	25	GND	30
13	Select	13	Shield		Shield

2.7.2 Optional interface (RS-232C)

This printer operates by being connected to a computer.

1. Turn off the power of the printer. Using an interface cable connect the computer to the optional interface connector at the rear panel of the printer.
2. Interface Cable
   The wire connection varies depending on the communication product.
   Prepare an appropriate cable for the communication protocol.

Connector: DSUB-25S.
Cable length: Less than 5 meters.



2.7.3 Optional Interface (USB)

This printer operates by being connected to a computer.

1. Turn off the power of the printer. Using an interface cable connect the computer to the optional interface connector at the rear panel of the printer.
2. Interface Cable
   USB connector for a printer is specified as a Type B Receptacle. Please use a Type B cable when you connect it with the printer.

2.7.4 Optional Interface (LAN)

This printer operates by being connected to a Network.

1. Turn off the power of the printer. Using an interface cable connect the computer to the optional interface connector at the rear panel of the printer.
2. Interface Cable
   Please use a cross-cable when you connect one printer to one computer. If you connect a printer to a HUB, please use a straight cable.

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3. Printer Configuration

3.1 DIP Switch Settings

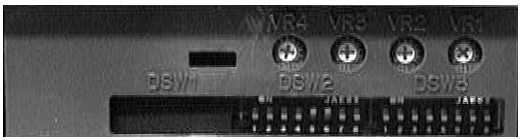
Two DIP switches DSW2 and DSW3 are located under the front cover panel and a DSW1 switch is located on an optional RS232 serial interface board.

These switches can be used to set:

- RS232C transmit/receive parameters
- Thermal transfer or direct thermal mode
- Label sensor enable/disable
- Head check mode
- Hex dump mode
- Receive buffer size
- Operation mode

DIP Switch Panel Layout for DSW1 Located on RS232 Interface Board

1		DATA	4		STOP	7	8	PROTCOL
OFF		8	OFF		1	OFF	OFF	READY/BUSY
ON		7	ON		2	OFF	ON	XON/XOFF
2	3	PARITY	5	6	RATE	ON	OFF	STATUS 3
OFF	OFF	NONE	OFF	OFF	9600	ON	ON	STATUS 4(NONE)
OFF	ON	EVEN	OFF	ON	19200	STATUS 4:DSW2-8 OFF		
ON	OFF	ODD	ON	OFF	38400	NONE : DSW2-8 ON		
ON	ON	UNUSED	ON	ON	57600	QC6772800		



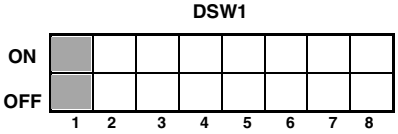
To set the switches, first power the unit Off, then position the DIP switches. After placing the switches in the desired positions, power the printer back on. The switch settings are read by the printer electronics during the power up sequence. They will not become effective until the power is cycled.

3.1.1 RS232 Transmit/Receive Setting

Data Bit Selection (DSW1-1)

This switch sets the printer to receive either 7 or 8 bit data bits for each byte transmitted.

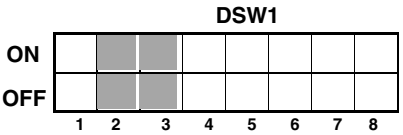
DSW1-1	SETTING
*OFF	8 Data Bits
ON	7 Data Bits



Parity Selection (DSW1-2, DSW1-3)

These switches select the type of parity used for error detection.

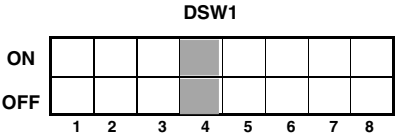
DSW1-2	DSW1-3	SETTING
*OFF	*OFF	No Parity
OFF	ON	Even
ON	OFF	Odd
ON	ON	Not Used



Stop Bit Selection (DSW1-4)

Selects the number of stop bits to end each byte.

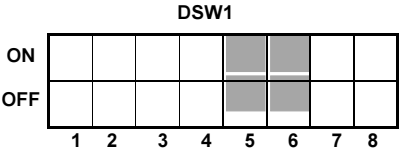
DSW1-4	SETTING
*OFF	1 Stop Bit
ON	2 Stop Bits



Baud Rate Selection (DSW1-5, DSW1-6)

Selects the data rate(bps) for the RS232 port.

DSW1-5	DSW1-6	SETTING
*OFF	*OFF	9600
OFF	ON	19200
ON	OFF	38400
ON	ON	57600

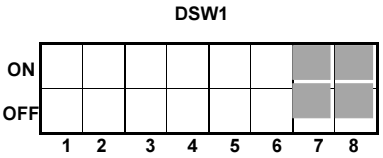


*** Factory Default**

Communication Protocol Selection (DSW1-7, DSW1-8)

Selects the flow control and status reporting.

DSW1-7	DSW1-8	SETTING
*OFF	*OFF	Rdy/Bsy
OFF	ON	Xon/XOff
ON	OFF	Status 3
ON	ON	Status 4

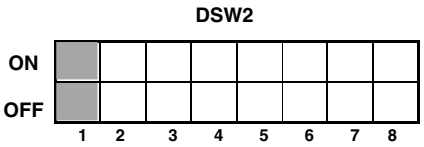


Note: For Status 4 the DSW2-8 must be set to OFF

Print Mode Selection (DSW2-1)

Selects between direct thermal printing on thermally sensitive paper and thermal transfer printing using a ribbon.

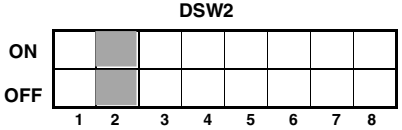
DSW2-1	SETTING
*OFF	Therm Trans
ON	Direct Therm



Sensor Type Selection (DSW2-2)

Selects type of sensing.

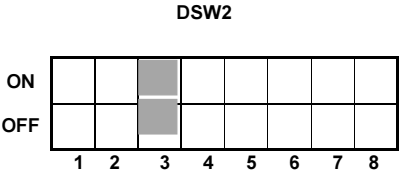
DSW2-2	SETTING
*OFF	Gap
ON	"I" Mark



Head Check Selection (DSW2-3)

When selected, the printer will check for head elements that are electrically malfunctioned.

DSW2-3	SETTING
*OFF	Disabled
ON	Enabled

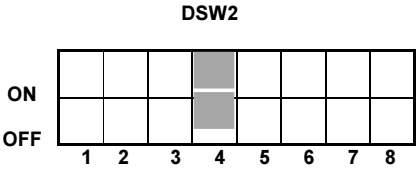


*** Factory Default**

Hex Dump Selection (DSW2-4)

Enables Hex Dump mode.

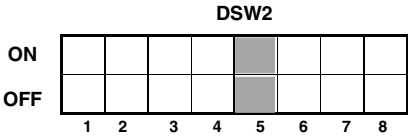
DSW2-4	SETTING
*OFF	Disabled
ON	Enabled



Receive Buffer Selection (DSW2-5)

Selects the operating mode of the receive buffer.

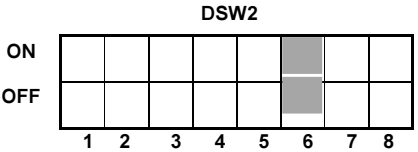
DSW2-5	SETTING
OFF	Single Job
*ON	Multi Job



Download Mode (DSW2-6)

For Firmware Download.

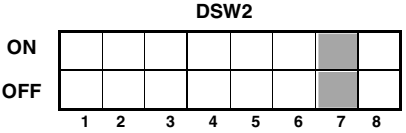
DSW2-6	SETTING
*OFF	Disabled
ON	Enabled



Protocol Control Code Selection (DSW2-7)

Selects the command codes used for protocol control.

DSW2-7	SETTING
*OFF	Standard
ON	Non-Std.



*** Factory Default**

Selecting Protocol Control Codes

Protocol control codes are the special control characters that prepare the printer to receive instructions. For example, the <ESC> character tells the printer that a command code will follow and the <ENQ> character asks for the printer status.

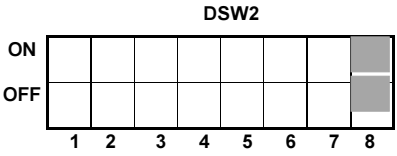
There are two pre-defined sets of Protocol Control codes to choose from. Each set is made up of six special characters. The Standard Protocol Control codes are non-printable characters, and the Non-Standard Protocol Control codes are printable characters. The Non-Standard set may be useful on host computers using protocol converters or in an application where non-printable ASCII characters cannot be sent from the host. This manual uses the Standard Protocol Control codes for all of the examples. Alternately, the user may define and download a set of custom Protocol Control Codes.

CONTROL CHARACTER	STANDARD DSW2-7 OFF	NON-STANDARD DSW2-7 ON	DESCRIPTION
STX	02 Hex	7B Hex = {	Start of Data
ETX	03 Hex	7D Hex = }	End of Data
ESC	1B Hex	5E Hex = ^	Command code to follow
Null	00 Hex	7E Hex = ~	Cutter command
ENQ	05 Hex	40 Hex = @	Get printer status, Bi-Com mode
Can	18 Hex	21 Hex = !	Cancel print job, Bi Com mode
Off-Line	40 Hex	5D Hex =]	Take printer Off-Line

Compatibility Mode Selection (DSW2-8)

Software command compatibility with earlier SATO model printers.

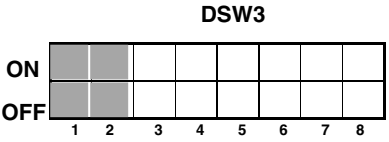
DSW2-8	SETTING
*OFF	Status 4
ON	Compatibility



Mode Selection (DSW3-1 and DSW3-2)

Selects the operating mode of the printer.

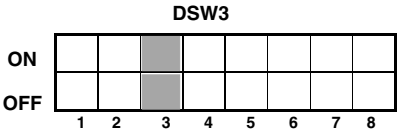
DSW3-1	DSW3-2	SETTING
*OFF	*OFF	Batch/Continuous
OFF	ON	Tear Off
ON	OFF	Cutter
ON	ON	Dispenser



Label Sensor Selection (DSW3-3)

Enables or disables the Label Sensor. If the Sensor is enabled, it will detect the edge of the label and position it automatically. If it is disabled, the positioning must be under software control using Line Feed commands.

DSW3-3	SETTING
*OFF	Sensor Used
ON	Sensor Not Used

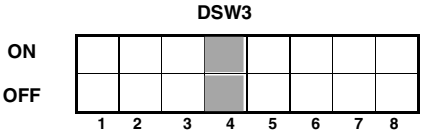


*** Factory Default**

Back Feed Selection (DSW3-4)

When Back-Feed is enabled, the printer will position the label for dispensing/cutting and retract it to the correct print position before printing the next label.

DSW3-4	SETTING
*OFF	Enabled
ON	Disabled



Note: Back Feed function only works, if Tear Off, Cutter or Dispenser is selected. See DSW3-1, 3-2.

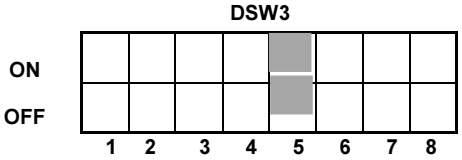
External Signal Interface

The EXT connector on the CL printer rear panel is intended for use with the external printer accessories such as label rewinders or applicators. The 14-pin Centronics type connector provides a choice of four different output signals along with various error conditions.

Print Start Signal Selection (DSW3-5)

DSW3-5	SETTING
*OFF	Disabled
ON	Enabled

(Output on Pin 5)

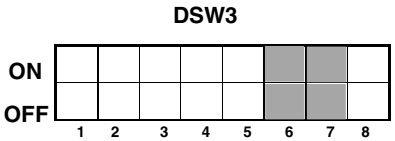


External Signal Type Selection (DSW3-6, DSW3-7)

Both the polarity and signal type (level or pulse) of the external print synchronizing signal can be selected.

DSW3-6	DSW3-7	SETTING
*Off	*Off	Type 4
Off	On	Type 3
On	Off	Type 2
On	On	Type 1

(Output on Pin 6)



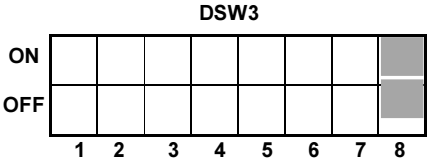
*** Factory Default**

Repeat Print via External Signal (DSW3-8)

Allows the applicator to reprint the current label in the print buffer.

DSW3-8	SETTING
*OFF	Disabled
ON	Enabled

(Output on Pin 7)



Note: The DIP Switch functions listed incorporate the latest firmware revisions at the time of printing.

*** Factory Default.**

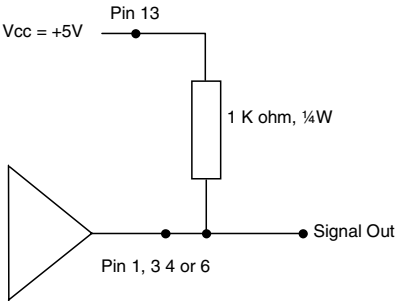
3.1.2 External Connector PIN Assignments

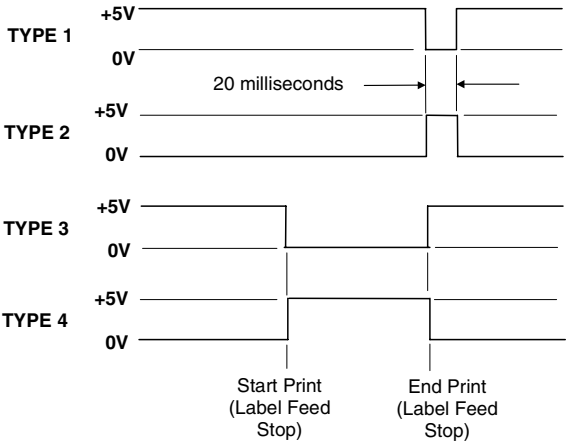
PIN	DIRECTION	SIGNAL DESCRIPTION
1	To Host	Label Out - This pin goes low (0V) when a label out error exists.
2	Reference	Signal Ground
3	To Host	Ribbon Out - This pin goes low when the ribbon is out.
4	To Host	Error - This pin goes low when the printer detects an error condition such as head open or receiving buffer full.
5	To Printer	Print Start - The printer will print one label when this pin is pulled to ground. This signal must be enabled by placing switch DSW3-5 on the Control Panel in the OFF position.
6	To Host	End Print - It is used to drive an applicator or other external device requiring synchronization with the print cycle. You may choose between four types of output signals using control panel DSW3-6 and DSW3-7 selections.
7	To Printer	Print Repeat - The printer repeatedly prints the current label in the print buffer immediately after receiving this signal. DSW3-8 must be ON.
8	To Printer	Vcc - +5V
9	To Host	On-Line
10	To Host	Ribbon Near End
11	To Printer	TBD
12	To Host	+24V - Used to power accessory items.
13	To Host	Vcc - +5V
14	Reference	Frame Ground

NOTE: The signals on pins 1, 3 4 and 6 each have an open collector output. These pins normally measure +.07V maximum when a true condition exists. If a false condition occurs, the voltage will drop to 0V. To achieve a signal level of +5V, you must add a 1K ohm, ¼ W pull-up resistor between the open collector output pin and Vcc (pin 13) as illustrated. This will pro-

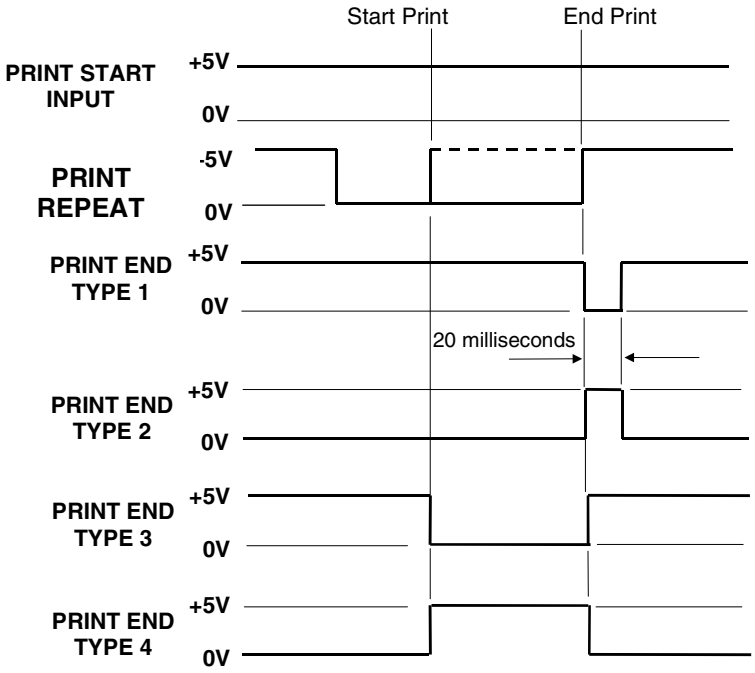
vide a signal level of +5V for a true condition and 0V when a false condition exists. The maximum voltage that can be applied to these pins is +50V and the maximum current they can sink is 500 milliamps.

External Output Signal Types

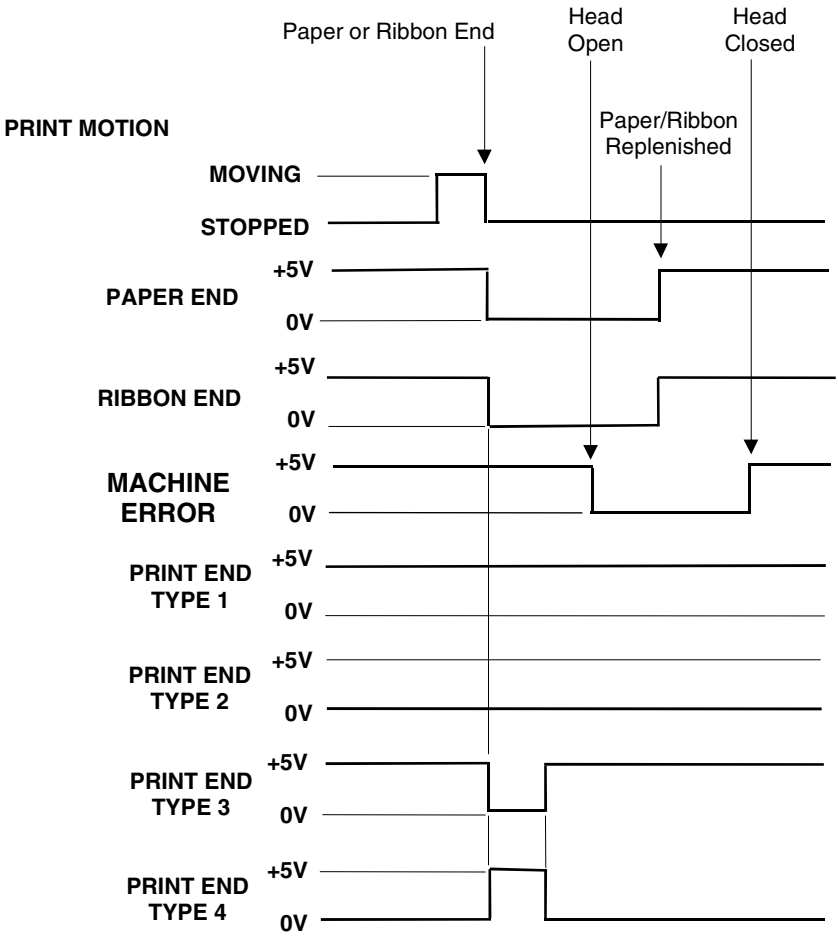




Repeat Print



Error Signals



3.2 Default Settings

Switch Selections

All switches except DSW2-5 are placed in the **OFF** position (default) for shipping. This will result in the following operating configuration:

- Communications: 8 data bits, no parity, 1 Stop bit, 9600 Baud
- Protocol: Ready/Busy
- Sensor: Gap Sensor
- Receive Buffer: Multi Job
- Mode: Batch/continuous
- Pitch: Sensor Used
- Back feed: Enabled
- External Signals: Disabled

Software Default Settings

The printer stores the software settings upon receipt and uses them until they are again changed by receipt of a command containing a new setting. These settings are stored in non-volatile RAM and are not affected by powering the printer off. The printer may be reset to use the default software settings by depressing the **LINE** and **FEED** keys simultaneously while powering the printer on. This will result in the following default configuration:

- Print Darkness: "2"
- Print Speed: 6 inches per second
- Print Reference: Vertical = 0000, Horizontal = 0000
- Zero: Slash
- Auto On Line: Enabled
- Ignore CR/LF: Disabled
- Character Pitch: Proportional
- Auto Online Feed: Disabled
- Feed On Error: Disabled
- Repeat Print: Disabled
- Forward/Backfeed: Standard
- Select Language: English
- Priority Setting: Command

3.3 Printer Adjustments

The LCD Panel is used in conjunction with the **LINE** and **FEED** switches by the operator to manually enter printer configuration settings. Many of the settings can also be controlled via software commands and in the case of conflict between software and control panel settings, the printer will always use the last valid setting. If you load a label job that includes software settings and then enter a new setting via the operation panel, the manually set values will be used by the printer. If you set the values manually and then download a job with software settings, the software settings will be used.

3.3.1 Normal Mode

When the printer is powered on, the readout should display the following message.

```
ONLINE
          QTY:000000
```

The LCD Panel will display the **ONLINE** status on the top line of the display and the bottom line will contain the label quantity (QTY) status. The **ONLINE** message will be changed to OFFLINE whenever the printer is switched **OFFLINE** by depressing the **LINE** key. As soon as a print job is received, the **QTY** message will indicate the number of labels to be printed. As soon as the label job begins to print, the display will indicate the number of labels remaining in the print job that remain to be printed.

3.3.2 User Mode

1. The printer is first taken offline by pressing the **LINE** key once. The display will change to:

```
OFFLINE
          QTY:000000
```

2. When the display changes to **OFFLINE**, press the **FEED** and **LINE** keys simultaneously for more than one second. The printer now displays the first USER mode adjustment (Print Darkness).

3.3.3 Print Darkness Setting

There are three **PRINT DARKNESS** (or heat range) settings. The higher numbers represent darker settings. The current setting is indicated by a blinking cursor on one of the range settings.

To change the setting perform the following steps:

1. Use the **LINE** key to step the blinking cursor to the desired setting.
2. Once the correct setting is selected, press the **FEED** key to accept the setting and advance to the next adjustment.

```
PRINT DARKNESS
1(L) 2(M) 3(D)
```

Note: This setting can be overridden by software.

3.3.4 Print Speed Adjustment

There are three **PRINT SPEED** settings. The setting is listed on the bottom line of the display. The current setting is indicated by a blinking cursor on one of the speed settings.

To change the setting perform the following steps:

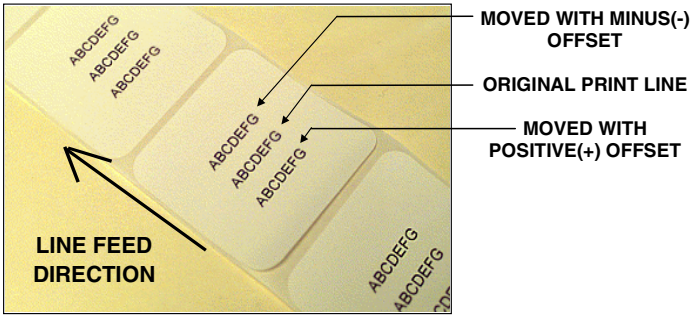
1. Use the **LINE** key to step the blinking cursor to the desired setting.
2. Once the correct setting is selected, press the **FEED** key to accept the setting and advance to the next adjustment.

```
PRINT SPEED
4 6 8
```

Note: This setting can be overridden by software.

3.3.5 Pitch Offset and Direction

The label pitch is the distance from the leading edge (the edge that comes out of the printer first) of a label and the leading edge of the next label. The leading edge position of the label can be adjusted relative to the print head +/- 49 mm in increments of 1 mm using the following procedure. Once the position is set, it can be adjusted +/- 3.75 mm using the PITCH potentiometer on the adjustment panel.



The label pitch is the distance from the leading edge (the edge that comes out of the printer first) of a label and the leading edge of the next.

To change the setting perform the following steps:

1. Use the **LINE** key to step the blinking cursor to either the positive (+) or the negative (-) selection. A positive selection moves the leading edge of the label forward (away from the print mechanism) while a negative selection moves the leading edge of the label back into the mechanism.

PITCH OFFSET
±00mm

2. Once the correct setting is selected, press the **FEED** key to accept the setting and advance to the Pitch Offset adjustment.

PITCH OFFSET
+00mm

3. Use the **LINE** key to step the counter to the desired position. The display will increment one step for each time the **LINE** key is pressed. The reading will advance to a setting of 4 mm for first

position and 9 mm for second position after which it will automatically wrap and start of “00” again. The pitch direction set in the previous step will be displayed in front of the Offset setting.

4. Once the setting is correct, press the **FEED** key to accept the setting and advance to the Cancel Print job display.
5. You may wish to check your settings by printing a test label after you have completed the adjustments to ensure that they are correct.

3.3.6 Cancel print Job

If the printer has a print job(s) loaded in memory, selecting **YES** will cause the job(s) to be cleared. The default selection is **NO**. Make sure that you want to cancel the print job before selecting YES as the job cannot be recovered and will have to be retransmitted to the printer.

To cancel the print perform the following steps:

1. Use the **LINE** key to step the blinking cursor to either **YES** or **NO**.

CANCEL PRINT JOB
NO YES

2. Once the correct setting is selected, press the **FEED** key to accept the setting and terminate the user mode of operation and return you to the normal mode **ONLINE** display.

   If you wish to change any of the settings, you must first set the printer to **OFFLINE** and enter the user mode again by simultaneously pressing **FEED** and **LINE** keys for more than one second.

3.3.7 Advanced Settings

See Appendix A for advanced settings.

Please not that you will need special instructions for some of these settings!

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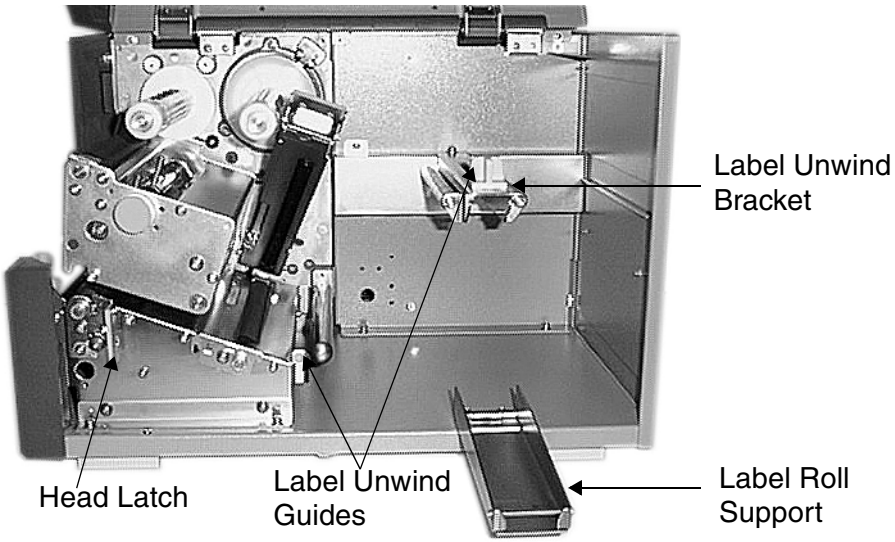
4. Media Loading

4.1 Loading Labels or Tags

Step 1 Open the side access door by swinging it up. The hinge system automatically dampens the movement to prevent the door from inadvertently falling and possibly causing injury to the operator.

Step 2 Open the print head assembly by turning the head latch toward the rear of the printer. The print head assembly is spring-loaded and will automatically open as soon as the head latch is disengaged.



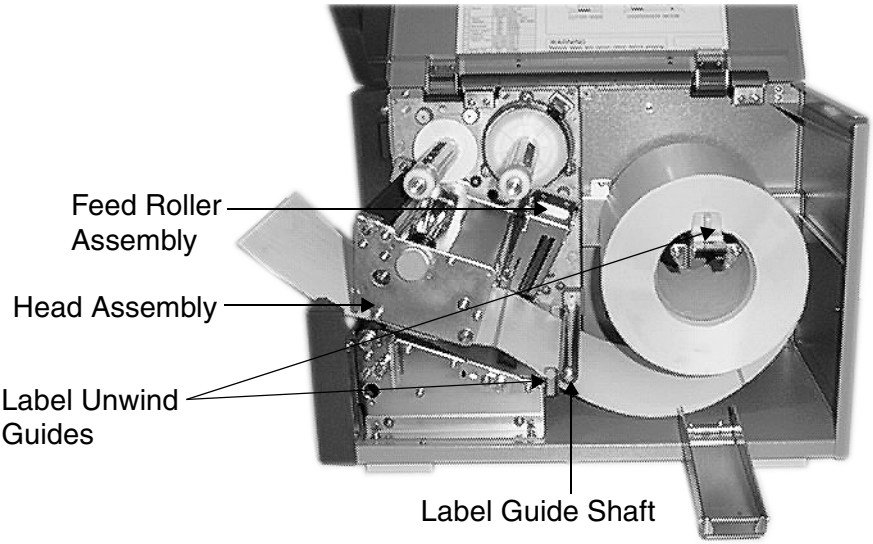
Step 3 Push the label unwind guide to the outside of the printer to give the maximum label width.

Step 4 Release the label roll support by pulling outward at the top, then swing it down and out of the way.

Step 5 If using roll labels (or tags), load the media roll onto the label unwind bracket so that the printing side of the labels faces upwards as it unwinds from the roll. Push the roll all the way to the inside of the printer and push the label unwind guide snugly against the outside of the label roll.

Step 6 When using fanfold labels (or tags) set them on a flat surface behind the printer. Pass the labels (printing side up) through the slot and under the label unwind bracket.

Step 7 Open the feed roller assembly by squeezing the green tab and the release tab together. The feed roller assembly is spring loaded and will open automatically when the latch is disengaged. Feed the labels under the label guide shaft, under the feed roller assembly, through the print head assembly and out the front of the printer.

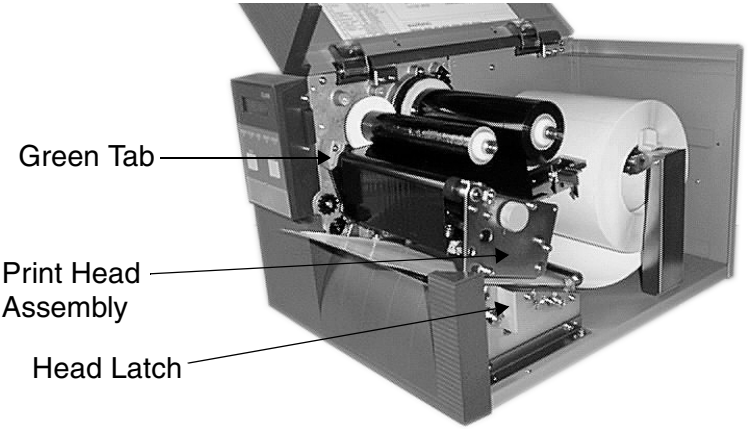


Step 8 Inspect the label route and check that the path matches that illustrated in the label loading diagram. Set the adjustable label guides to keep the labels against the backplate of the printer.

Step 9 Close the feed roller assembly by pushing downward on the green tab until it latches closed.

Note: When the label dispenser option has been installed, remove 600 to 800 mm of labels from the backing and feed the backing back through the label dispense path.

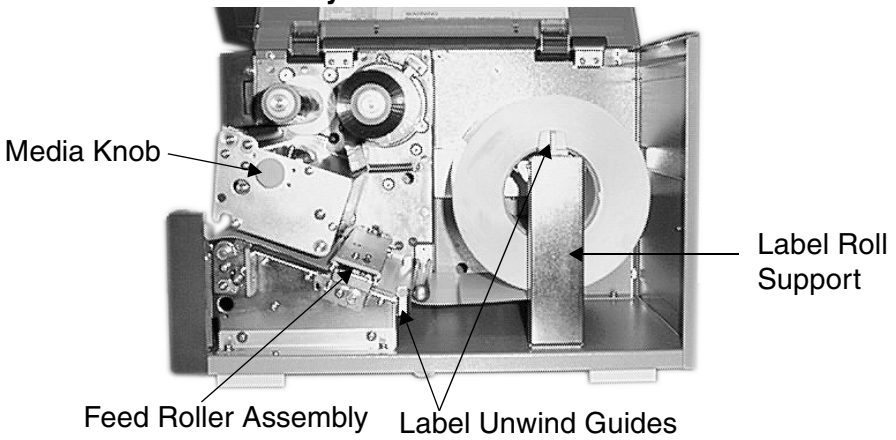
Step 10 If the ribbon is already loaded, close the print head assembly by pushing downward on the green tab until it latches closed.



Step 11 If the ribbon is not loaded, see the following description for loading instructions.

Step 12 Adjust the print head pressure knob based on the media you have loaded. For media up to 60mm wide, use the ”1“ position (minimum print head pressure), for media between 60 and 120mm wide, use the ”2“ position. For media wider than 120mm, use the “3“ position (maximum print head pressure).

Note: **If you use media narrower than 120mm, using the wrong setting will apply excessive pressure to the print head and may void the print head warranty.**

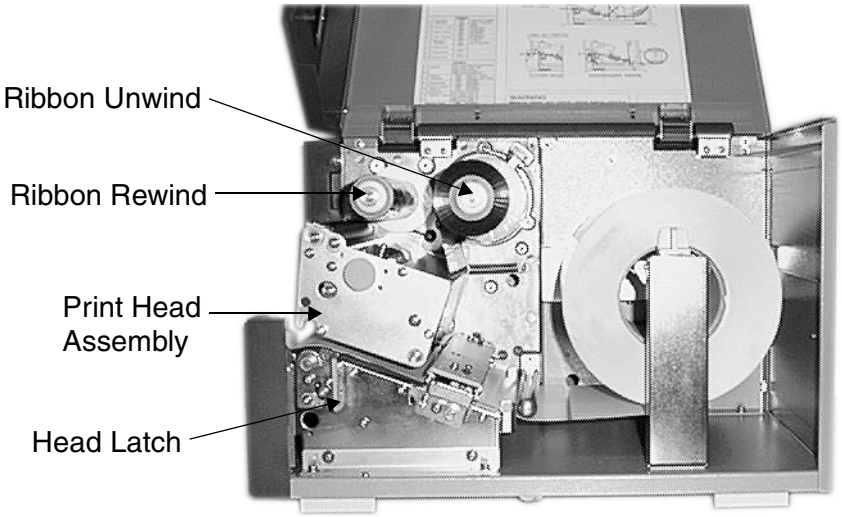


4.2 Insert Carbon Ribbon

Step 1 Open the side access door by swinging it up. The hinge system automatically dampens the movement to prevent the door from inadvertently falling.

Step 2 Open the print head assembly by turning the Head Latch toward the rear of the printer. The print head assembly is spring-loaded and will automatically open as soon as the head latch is disengaged.

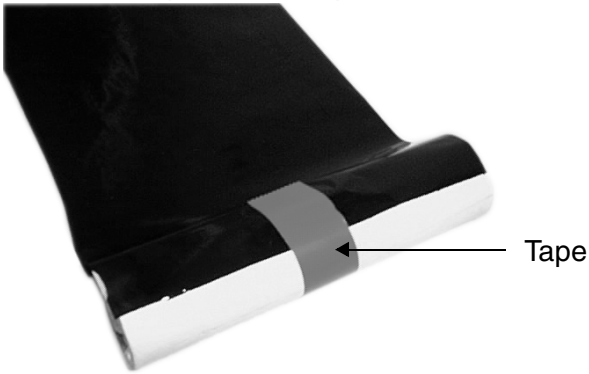
Step 3 Locate the spare ribbon core, supplied with the printer, on the ribbon rewind spindle. Place the core on the ribbon rewind spindle, pushing it all the way to the inside of the spindle. Note that the empty core of each subsequent roll becomes the next rewind core.



Step 4 Load the ribbon onto the ribbon unwind spindle, also pushing it all the way to the inside of the spindle. The side of the ribbon carrying the carbon ink should be facing down as it travels through the print head assembly.

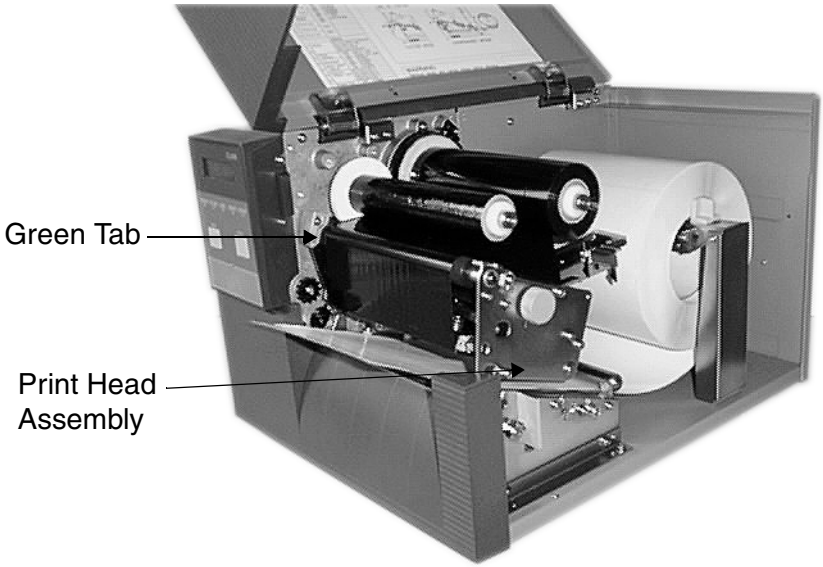
Step 5 Feed the leader portion of the ribbon through the print head assembly and up to the ribbon rewind spindle.

Step 6 Load the ribbon behind and over the top of the ribbon rewind spindle and tape it to the ribbon core.



Step 7 Manually turn the rewind spindle to wrap the ribbon onto the core making one to two turns to secure it.

Step 8 If the labels or tags are already loaded, close the print head assembly by pushing downward on the green tab until it latches closed.



Note: Run a test print to ensure that the labels and ribbons are loaded correctly.

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5. Troubleshooting

The design of the SATO CL-608e/612e printer is based upon proven technology and reliable components. When a problem occurs, the solution can be easily traced using the troubleshooting tables in this section. This table list symptoms, probable causes, and suggested corrective actions.

Both print quality and general operational problems are listed in the troubleshooting table.

5.1 Troubleshooting Tables

The troubleshooting table below includes the following general symptom descriptions:

- Image Voids
- Ribbon Wrinkle
- Light Images
- Smearing
- No Ribbon Movement
- No Label Movement
- No printed Image
- Display Problem
- POWER LED not on
- ERROR LED on
- LABEL LED on
- RIBBON LED on
- ON LINE LED not on
- No Label Drive

☺ The suggested actions may be carried out by the end-user.

🛠 The suggested actions should only be carried out by experienced service staff. Recall your reseller or service agent.

5.2 Print Quality Problems

Symptom	Probable Cause	Suggested Corrective Action
Image Voids	Poor quality labels	Use thermal transfer compatible stock ☺
	Poor quality ribbons	Use genuine SATO ribbons ☺
	Ribbon not matched to label stock	Check with media suppliers ☺
	Damaged electronics	Replace circuit board 🛠
	Damaged Platen	Replace Platen 🛠
Ribbon Wrinkle	Poor Head Alignment	Adjust head balance 🛠 Adjust ribbon roller 🛠 Adjust head alignment 🛠
	Poor Ribbon Tension	Adjust ribbon tension 🛠
	Worn Platen	Replace platen 🛠
	Foreign material on head or platen	Clean head and platen ☺
	Foreign materials on labels	Use high quality label stock ☺
	Damaged print head	Replace print head 🛠
Light Images	Poor quality labels	Use thermal transfer compatible stock ☺
	Poor quality ribbons	Use genuine SATO ribbons ☺
	Low print head energy/darkness	Adjust darkness control ☺
	Low print head pressure	Use correct head pressure position 🛠
	Ribbon not matched to label stock	Select better suited carbon Ribbon ☺
	Low ribbon drive torque No ribbon movement	Adjust ribbon drive clutch 🛠
	Foreign material on head	Clean head and platen ☺
	Poor head alignment	Align Print Head 🛠
	Excessive print speed	Reduce print speed setting ☺

Symptom	Probable Cause	Suggested Corrective Action
Smearing	Poor quality labels	Select better suited carbon Ribbon ☺
	Poor quality ribbons	Use genuine SATO ribbons ☺
	Foreign material on head/platen	Clean head and platen ☺
	Foreign material on labels	Use high quality label stock ☺
	Excessive print head energy	Adjust darkness control ☺
	Excessive print speed	Adjust print speed ☺
	Excessive head pressure	Use correct head pressure position 🛠
No Ribbon Movement	Incorrect ribbon core size	Use genuine SATO ribbons ☺
	Loose drive clutch	Adjust clutch tension 🛠
	Loose platen drive belt	Adjust/replace belt 🛠
	No + 24 volt output	Test power supply and replace if required 🛠
	Loose service screws on rewind pulley	Tighten service screws 🛠
	Damaged electronics	Replace circuit board 🛠
No Label Movement	Loose/broken platen drive belt	Adjust/replace belt 🛠
	Incorrect label pitch sensor selected	Select correct label sensor type (DSW2-2) ☺
	No +24 volt output	Replace fuse on main PCB 🛠 Test power supply and replace if required 🛠
	Loose set screw on platen pulley/stepper motor	Tighten set screws 🛠
No Printed Image	Print head not connected	Verify print head connector fully seated at head and PCB 🛠
	Ribbon upside down	Use genuine SATO ribbons ☺
	No + 24 volt output	Test power supply and replace if required 🛠

Symptom	Probable Cause	Suggested Corrective Action
No Printed Image	Damaged print head	Replace print head 🛠
	Damaged electronics	Replace circuit board 🛠
Back light but no words on display or no display.	Most common failure of printer is DOA situation. The most likely cause is the ribbon cable has fallen out or not seated fully into connector.	Verify that the cable and connector are properly seated ☺
POWER LED not on	AC power cable not connected	Verify that the cable is connected to the printer and the AC outlet ☺
	Main Power Fuse defective	Replace fuse 🛠
	Defective power supply	Test power supply and replace if defective 🛠
ERROR LED on	Head not locked	Close and latch head release ☺
LABEL LED on	Label supply roll empty	Replenish label supply ☺
	Label stock not routed through sensor	Reload labels ☺
	Label sensor not positioned correctly	Adjust sensor position 🛠
	Label sensor blocked	Clean label sensor ☺
	Incorrect label sense threshold setting	Adjust label sense threshold 🛠
RIBBON LED on	Ribbon supply roll empty	Replenish ribbon supply 🛠
	Ribbon sensor out of alignment	Realign ribbon sensor 🛠
	Ribbon sensor blocked	Clean ribbon sensor ☺
	No cardboard core on ribbon rewind	Use cardboard core on ribbon rewind ☺
ON LINE LED not on	LABEL, RIBBON, ERROR LED (s) on	Clear error condition ☺
	Illegal printer memory state	Cycle POWER switch off and back on ☺
No Label Drive	Timing Belt bad/loose	Replace/tighten timing belts 🛠

6. Cleaning and Maintenance

6.1 Introduction

Contents:

The following is contained in this chapter:

- Cleaning the print head, platen and rollers
- Cleaning the sensors

Proper handling:

The print head contains a precise printing surface that must be carefully protected from mechanical damage. Extreme care must be exercised during handling and installation to prevent scratching, chipping, denting or otherwise damaging the exposed surface, particularly in the resistor (printing element) area. A thin, clean piece of cardboard should be placed between print head and platen to protect the substrate during the installation.

Cleaning:

Only solvent and other cleaning methods recommended by SATO should be used to periodically remove paper residue from the print head. Apply carefully with a cotton swab. Frequency of cleaning depends upon paper type and mechanical factors and should be completed at each ribbon change.

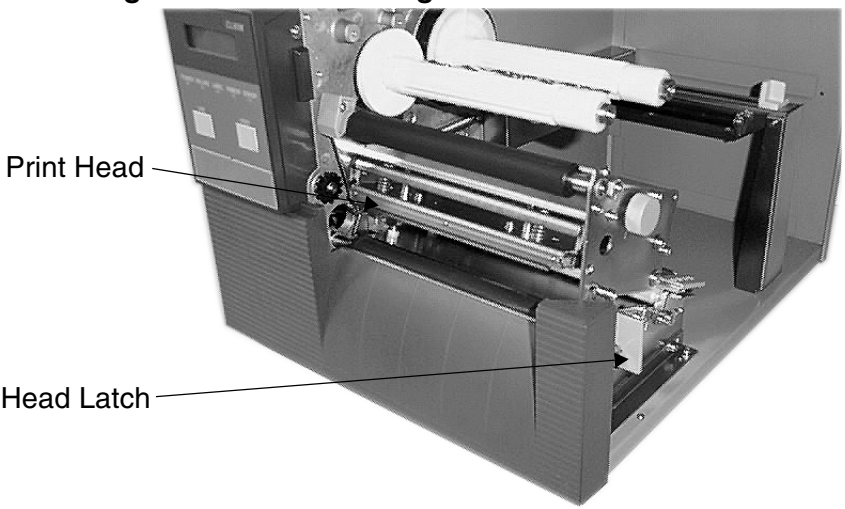
Do not use unauthorised abrasive materials in cleaning. However, SEG supplies a special Cleaning Kit, **SEG-No. 5983**, to prepare the print head surface.

Only clean when print head has been de-energized and cooled to room temperature to avoid thermal shock damage.

Do not operate the machine for at least 15 minutes after cleaning to ensure the head is totally dry of any cleaning fluids.

6.2 Cleaning the Print Head, Platen and Rollers

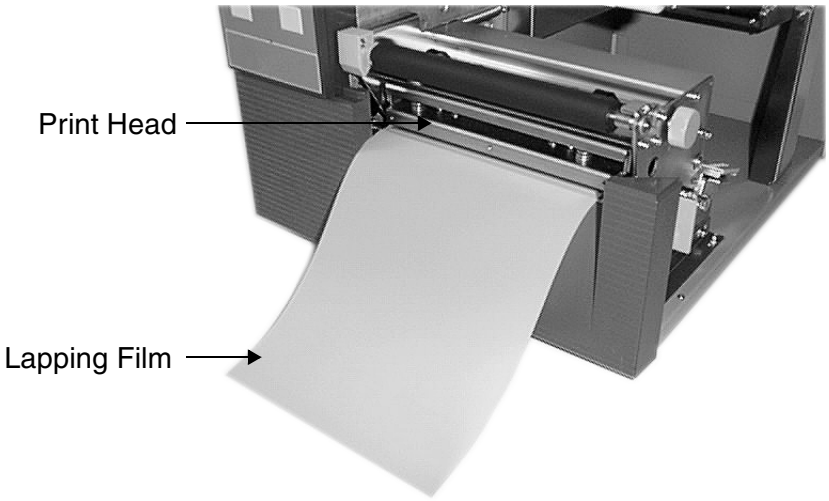
Cleaning the Print Head using Print Head Cleaner



Step 1	Switch **OFF** the power to the printer.
Step 2	Open the label access door.
Step 3	Open the print head assembly by turning the head latch toward the rear of the printer. The print head assembly is spring-loaded and will automatically open as soon as the head latch is disengaged.
Step 4	Apply any SATO approved thermal print head cleaner to a cotton swab.
Step 5	The print head faces downward along the front edge of the assembly. Pass the end of the dampened swab along the entire width of the print head. (You may need to move the ribbon out of the way to do this.)
Step 6	Check for any black colouring or adhesive on the swab after cleaning.
Step 7	Repeat as necessary until the swab stays relatively clean, after being passed over the head.
Step 8	The head should be cleaned at least every time the ribbon is changed and more often in dusty environments.

Cleaning the Print Head using the Lapping Film (SEG No. 1938)

Step 1	Cut the lapping film with a pair of scissors or a sharp knife to 180mm width.
Step 2	Switch **OFF** the power to the printer.
Step 3	Place the lapping film between print head and platen with the abrasive side face-up. Close the print head with the head latch.
Step 4	Pull the cleaning film by hand slowly toward the front of the printer.
Step 5	Repeat steps 3 and 4 two or three times.
Step 6	Finally, clean the print head with a print head cleaner as described previously.



Cleaning the Platen

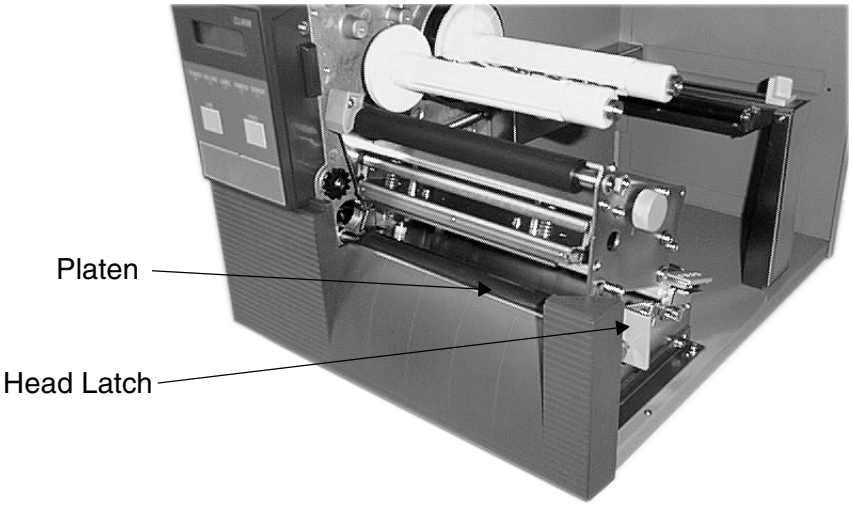
Step 1 Switch **OFF** the power to the printer.

Step 2 Open the label access door.

Step 3 Open the print head assembly by pushing the head latch toward the rear of the printer. The print head assembly is spring-loaded and will automatically open as soon as the head latch is disengaged.

Step 4 Apply any SATO approved thermal printer cleaner to a clean wipe.

Step 5 The platen is the rubber roller directly below the print head. It should be cleaned of any ribbon or label residue.



Step 6 Repeat as necessary. The platen should be cleaned whenever foreign matter such as dust or adhesive is present.

Cleaning the Roller and Label Guides

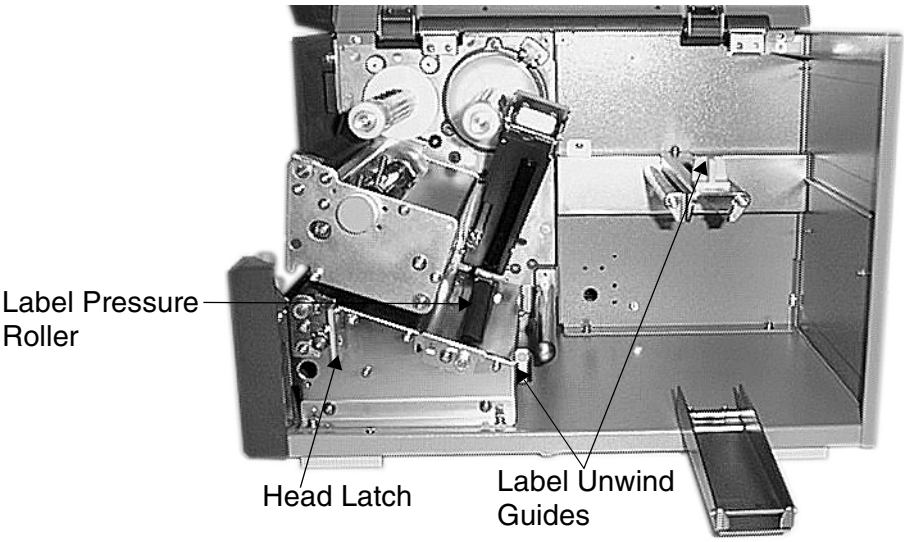
Step 1 Switch **OFF** the power to the printer.

Step 2 Open the label access door.

Step 3 Open the print head assembly by pushing the head latch toward the rear of the printer. The print head assembly is spring-loaded and will automatically open as soon as the head latch is disengaged.

Step 4 Apply any SATO approved thermal printer cleaner to a clean wipe.

Step 5 The label pressure roller is located underneath the feed roller assembly. It should be cleaned of any label residue or other foreign material.



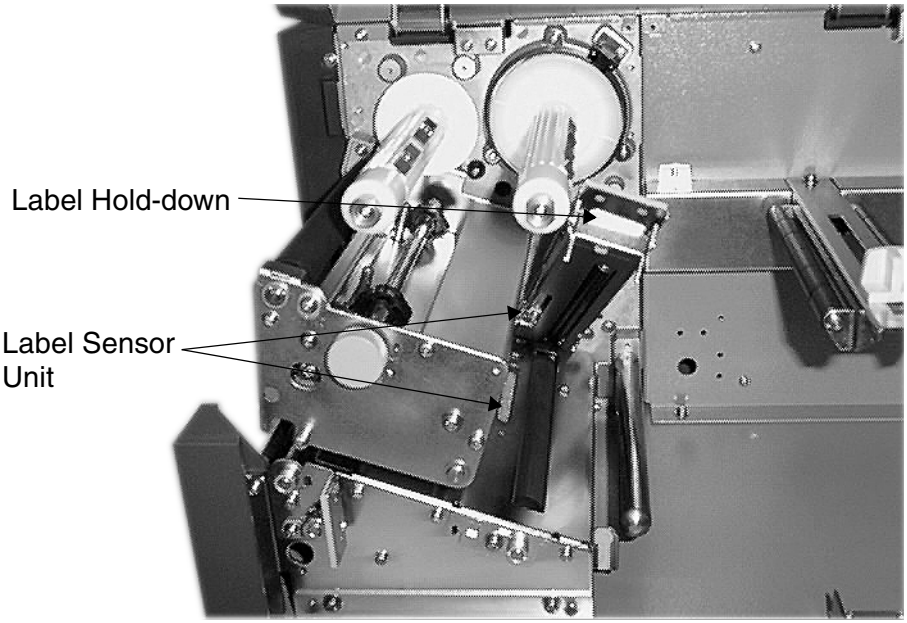
Step6 The label unwind guides used in guiding the labels through the printer must be cleaned of any label or ribbon residue or other foreign material.

Step7 Repeat as necessary. The rollers and guides should be cleaned whenever foreign matter such as dust or adhesive is present.

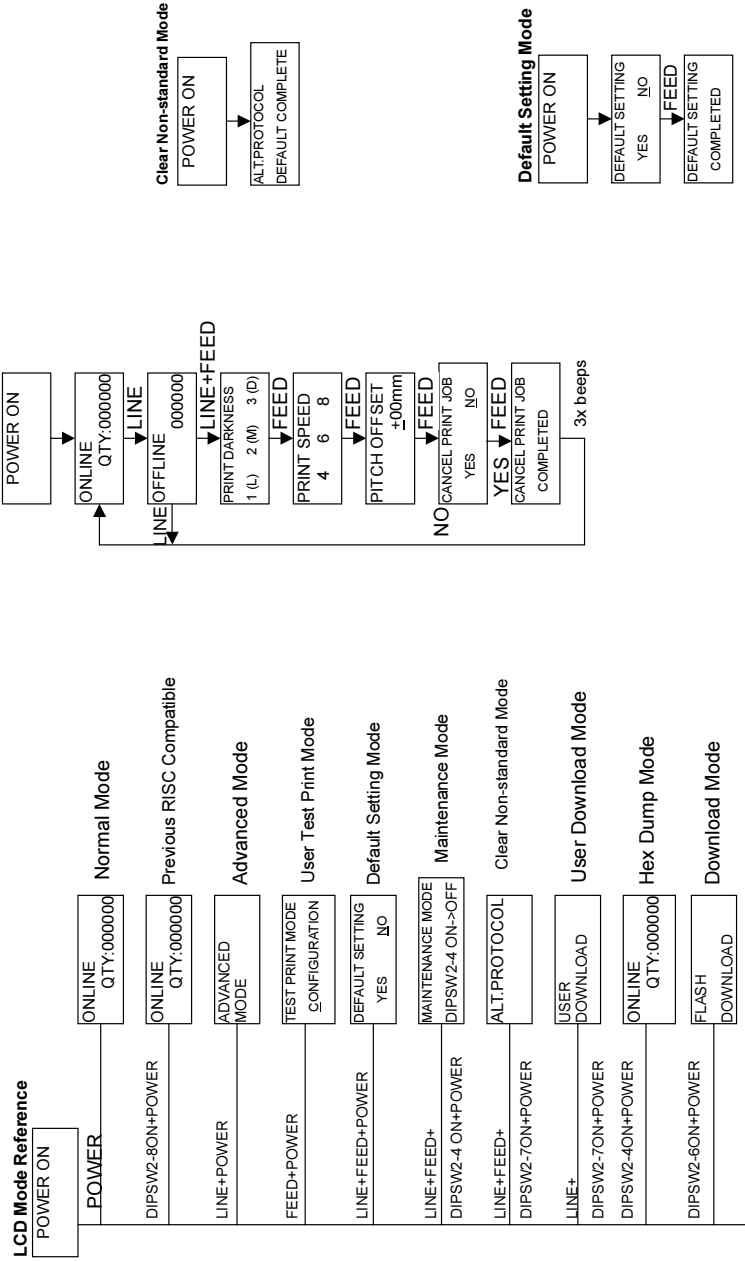
6.3 Cleaning the Label Sensor Unit

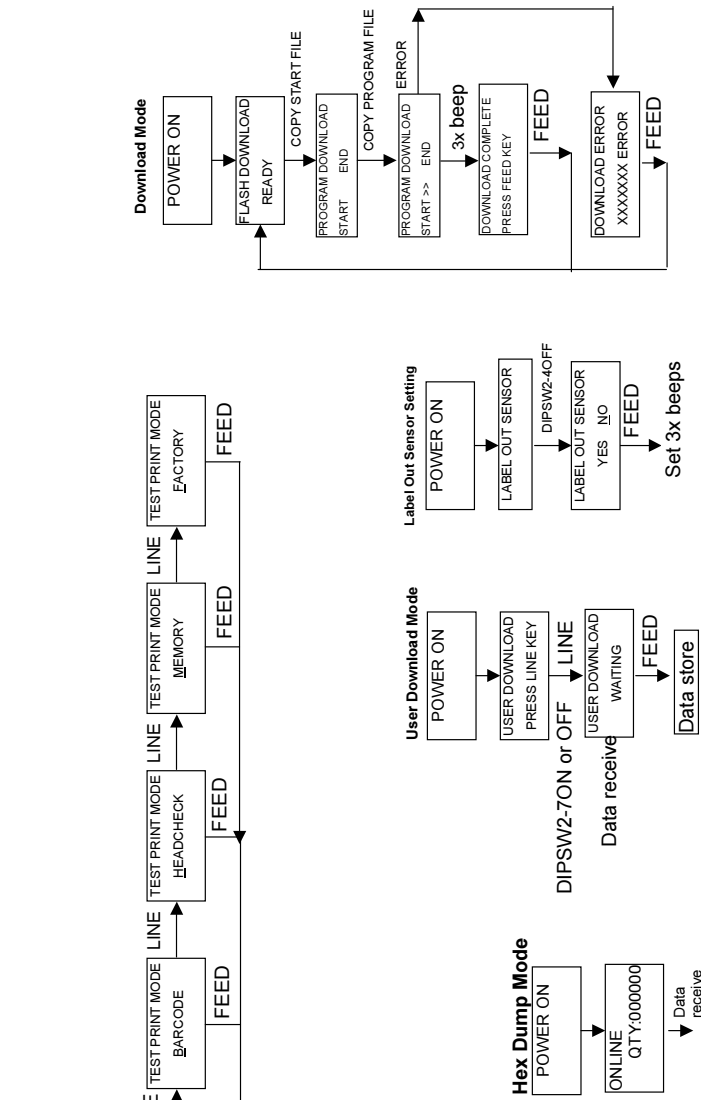
There are two sensors that are used to control the positioning of the label. One is a transmissive see-through sensor that detects the edge of the label by looking through the backing paper which is translucent and detecting the presence of the opague label. The other is a reflective sensor that detects the light reflected from the bottom of the label liner. When dust, dirt or other foreign matter interfers with the light path of either of these snsors, the result is erratic label positioning. These sensors should be cleaned regularly, at least every two rolls of label.

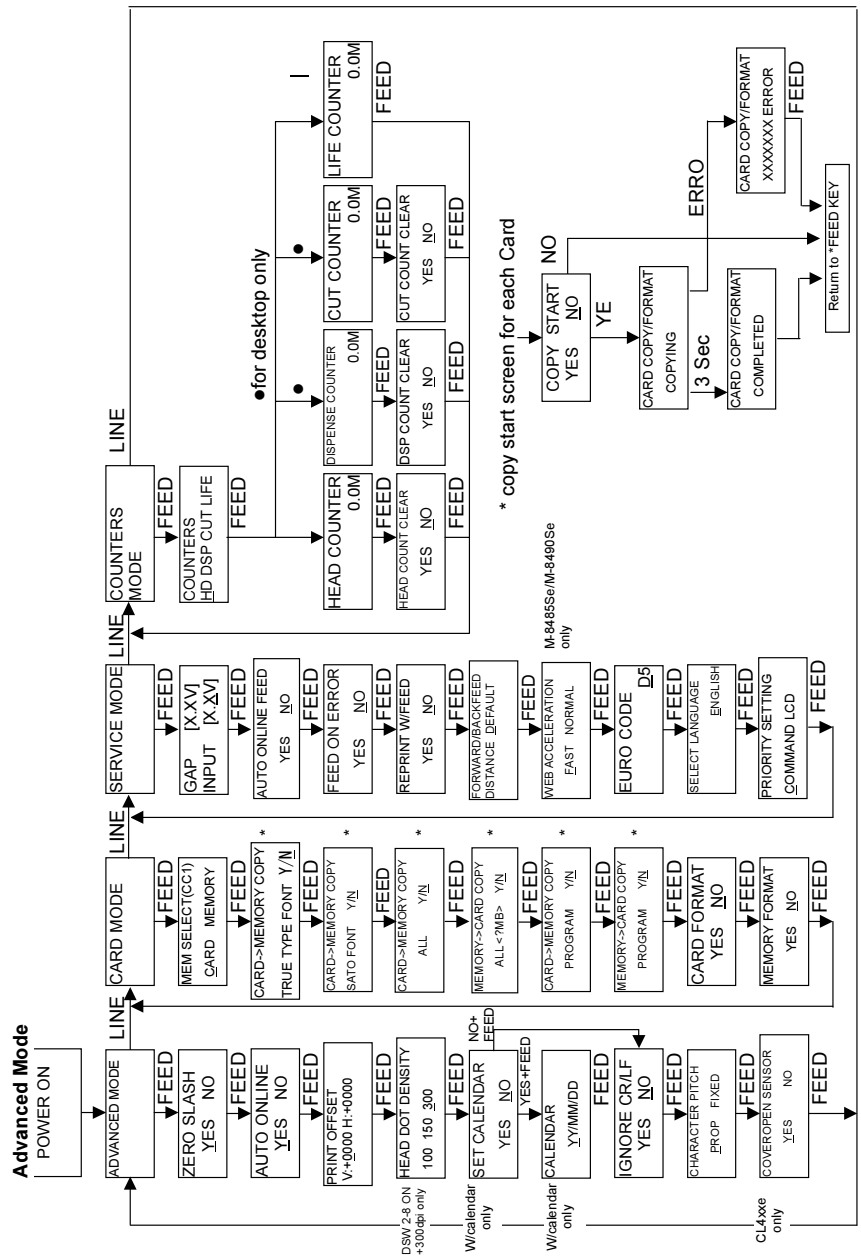
1. Turn the printer **OFF** and remove the power cable.
2. Open the Label Access Door.
3. Open the Label Hold-down by disengaging the latch. The Label Hold-down is spring loaded and will stay in the up position.
4. Apply SATO Thermal Print Head Cleaner to one of the cotton swabs.
5. Use the cotton swab to clean any foreign matter from the exposed surface of the sensors.



Appendix A Advanced Settings




Download Mode
POWER ON
FLASH DOWNLOAD
READY
COPY START FILE
PROGRAM DOWNLOAD
START END
COPY PROGRAM FILE
PROGRAM DOWNLOAD
START >> END
ERROR
3x beep
DOWNLOAD COMPLETE
PRESS FEED KEY
FEED
DOWNLOAD ERROR
XXXXXXX ERROR
FEED
Label Out Sensor Setting
POWER ON
LABEL OUT SENSOR
DIPSW2-4OFF
LABEL OUT SENSOR
YES NO
FEED
Set 3x beeps
User Download Mode
POWER ON
USER DOWNLOAD
PRESS LINE KEY
LINE
DIPSW2-7ON or OFF
USER DOWNLOAD
WAITING
FEED
Data receive
Data store
Hex Dump Mode
POWER ON
ONLINE
QTY:000000
Data receive
Hex Dump
User Test Print
POWER ON
TEST PRINT MODE
CONFIGURATION
FEED
LINE
TEST PRINT MODE
BARCODE
FEED
LINE
TEST PRINT MODE
HEADCHECK
FEED
LINE
TEST PRINT MODE
MEMORY
FEED
LINE
TEST PRINT MODE
FACTORY
FEED
TEST PRINT SIZE
16CM
FEED
PRESS FEED KEY
TO STOP PRINTING


Advanced Mode
POWER ON
ADVANCED MODE
ZERO SLASH YES NO
AUTO ONLINE YES NO
PRINT OFFSET V:+0000 H:+0000
HEAD DOT DENSITY 100 150 300
SET CALENDAR YES NO
CALENDAR YY/MM/DD
IGNORE CR/LF YES NO
CHARACTER PITCH PROP FIXED
COVEROPEN SENSOR YES NO
CARD MODE
MEM SELECT(CC1) CARD MEMORY
CARD->MEMORY COPY
TRUE TYPE FONT Y/N
CARD->MEMORY COPY SATO FONT Y/N
CARD->MEMORY COPY ALL Y/N
MEMORY->CARD COPY ALL<?MB> Y/N
CARD->MEMORY COPY PROGRAM Y/N
MEMORY->CARD COPY PROGRAM Y/N
CARD FORMAT YES NO
MEMORY FORMAT YES NO
SERVICE MODE
GAP INPUT [X.XV] [X.XV]
AUTO ONLINE FEED YES NO
FEED ON ERROR YES NO
REPRINT W/FEED YES NO
FORWARD/BACKFEED DISTANCE DEFAULT
WEB ACCELERATION FAST NORMAL
EURO CODE D5
SELECT LANGUAGE ENGLISH
PRIORITY SETTING COMMAND LCD
COUNTERS MODE
COUNTERS HD DSP CUT LIFE
HEAD COUNTER 0.0M
HEAD COUNT CLEAR YES NO
DISPENSE COUNTER 0.0M
DSP COUNT CLEAR YES NO
CUT COUNTER 0.0M
CUT COUNT CLEAR YES NO
LIFE COUNTER 0.0M
•for desktop only
* copy start screen for each Card
M-8485Se/M-8490Se only
COPY START YES NO
CARD COPY/FORMAT COPYING
3 Sec
CARD COPY/FORMAT COMPLETED
ERRO
CARD COPY/FORMAT XXXXXXX ERROR
Return to *FEED KEY
LINE
FEED
NO+FEED
YES+FEED
DSW 2-8 ON +300dpi only
W/calendar only
W/calendar only
CL4xxe only

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Appendix B Declaration of Conformity

MANUFACTURERS DECLARATION OF CONFORMITY

Product identification	Product:	Thermal or Thermal Transfer Printer
	Type:	**CL608e and CL612e**
	Options:	all

Means of conformity
The product is in conformity with the **EMC Directive 89/336/EEC, 92/31/EEC and 93/68/EEC** based on test results using harmonised standards.

standards used:	EN55022 :1994+A1:1995+A2:1987 class B EN61000-3-2: 1995 + A1: 1998 + A2: 1998 EN61000-3-3: 1995 EN55024: 1998
Test report number:	21BE0023-YW-1
Test carried out by: Date:	A-pex International 13. 10. 2000

Both models have the same CPU clockrate only the printhead for CL608e has a lower density. Therefore CL612e was used for the EMC test.

The product is in conformity with **Low Voltage Directive 73/23/EEC** based on test results using harmonised standards.

standards used:	EN60950 / A11 : 1997
Test carried out by: Certificate No: Date:	TÜV Product Service AL 00 11 15569 021 11.06.2000

Manufacturer: Bar Code SATO Electronics (M) SDN. BHD.
Lot 20, Jalan 223
46100 Petaling Jaya
Selangor Darul Ehsan, Malaysia

EC Representative: SATO Europe GmbH
Im Hülsenfeld 13
40721 Hilden
Germany

Signature:
Function: AG Britts
Director and General Manager SATO Europe GmbH
Date: 18. 12. 2000

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